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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/717,567	11/21/2000	Paul A. Kohl	PRMSP0217USA	2128
<div>7590 Don W. Bulson, Esq. RENNER, OTTO, BOISSELLE &amp; SKLAR, LLP 19th Floor 1621 Euclid Avenue Cleveland, OH 44115</div>			<div>EXAMINER MITCHELL, JAMES M</div>	
			<div>ART UNIT 2813</div>	<div>PAPER NUMBER</div>
			<div>MAIL DATE 01/25/2008</div>	<div>DELIVERY MODE PAPER</div>

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<p align="center"><b>Office Action Summary</b></p>	<p><b>Application No.</b></p> <p>09/717,567</p>	<p><b>Applicant(s)</b></p> <p>KOHL ET AL.</p>	
	<p><b>Examiner</b></p> <p>James M. Mitchell</p>	<p><b>Art Unit</b></p> <p>2813</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 59-74 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 59-74 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| <p>1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br/> Paper No(s)/Mail Date _____.</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/> Paper No(s)/Mail Date. _____.</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application</p> <p>6) <input type="checkbox"/> Other: _____.</p> |
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### DETAILED ACTION

1. This office action is in response to applicant's remarks filed November 30, 2007.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 59-65, 67 and 72-73 are rejected under 35 U.S.C. 102(b) as being anticipate by Masaaki (JP 62-005643).
4. Masaaki (Fig.1) discloses:  
  
(cl. 59, 61, 67, 74) a semiconductor device comprising: a substrate (1); a patterned layer (3-5) includes a regions (i.e. left and to the right of gap) thereof bordered by air gaps (7); and an overcoat layer (2) overlying the patterned layer of conductive material and the air gap, the overcoat layer having a portion thereof overlying the conductive material in the region bordered by the air gaps, and said portion extending below the height (i.e. top of gap) of the adjacent air gaps, and the air gaps are of a uniform width over the height thereof (i.e. interpreted to mean the width in the uppermost region of gap is uniform; see Fig. 1);  
  
(cl. 60) and the conductive material forms leads/wiring of a semiconductor device  
(English Title);  
  
(cl. 62-64) wherein the overcoat is a dielectric/non-conducting, silicon dioxide material  
(Eng. Abstract);

(cl. 63) and a surface (i.e. portion defining gap) of the conductive material adjacent air gap is covered by a film of non-conducting material;

(cont. cl. 67) and the air gaps extend below the conductive material (i.e. below wiring; Fig. 1);

5. With respect to the intended use limitation of claim 65 that "...the non-conducting material controls corrosion," the prior art form s the same structure as claimed. As such, the intended use limitation does not impart patentability, since it has been held that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

6. With respect to claims 72 and 73, although Masaaki<sup>1</sup> has the same structure as that claimed, Masaaki does not appear to explicitly disclose the process limitation "such as" the conductive layers being patterned and the semiconductor device formed by removing a sacrificial material from a pre-cursor made in accordance with a "method comprising the steps of: (A) forming a patterned layer of the sacrificial material on a substrate corresponding to a pattern of air gaps to be formed in the semiconductor structure..." "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is

unpatentable even though the prior product was made by a different process.” In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

7. Claim 68-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Avanzino (U.S 5,776,834).
8. Avanzino (Fig 16) discloses a semiconductor device comprising: a substrate (11,15); a patterned layer (12) of conductive material disposed on the substrate and having a region thereof bordered by air gaps (i.e. not labeled); and an overcoat layer (20) overlying the patterned layer of conductive material and the air gap, the overcoat layer having a portion thereof overlying the conductive material in the region bordered by the air gaps; and wherein a surface of the conductive material adjacent a respective air gap is covered by a discrete film (26) of [also cl. 69, 70] silicon dioxide, non-conducting material (Col. 7, Lines 6-8) that does not extend over the conductive material beyond (i.e. interpreted to mean that film extend to a greater distance/height than gap) the air gap that controls corrosion of the surface of the conductive material covered by the film, wherein the film controls corrosion, see paragraph 6.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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<sup>1</sup> Avanzino was mistakenly referenced and has now been omitted, because the rejection was drawn only to Masaaki as indicated in the rejections heading. The change in name does not change the scope of the

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 66 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki (JP62-005643).

11. Masaaki discloses the elements stated in paragraphs 4-6 of this office action and further a thickness of the film (i.e. three dimensional) and the substrate having a planar extent (i.e. top surface of substrate, 11 is planar), but does not appear to explicitly disclose that the non-conducting material has a thickness of about 100 Å or that upper sides of the gap are parallel to the planar extent.

12. Since applicant has not disclosed that its dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, it would have been obvious to form the film at the claimed thickness or gap with the claimed shape, since it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

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rejection, because the rejection based on the limitation being drawn to the process remains the same.

13. Claims 71 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Avanzino (U.S. 5,776,834).

14. Avanzino discloses the elements stated in paragraph 8 of this office action and further a thickness of the film (i.e. three dimensional) and the substrate having a planar extent (i.e. top surface of substrate, 11 is planar), but does not appear to explicitly disclose that the non-conducting material has a thickness of about 100 Å or that upper sides of the gap are parallel to the planar extent.

15. With respect to the claimed size and shape, see paragraph 13 of this office action.

16. Claims 68-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki<sup>2</sup> (JP62-005643) in combination with Avanzino (U.S. 5,776,834).

17. Masaaki discloses the elements stated in paragraphs 4-6 of this office action, but does not appear to show a discrete film of non-conducting material that does not extend over the conductive material and beyond the air gap (i.e. interpreted to mean that film extend to a greater distance/height than gap).

18. Avanzino utilizes (as indicated *supra*) a discrete film (26) of silicon dioxide, non-conducting material that does not extend over the conductive material beyond the air gap (Fig. 16).

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<sup>2</sup> Likewise the previous cited art, Machida (JP63-098134) could have been alternatively used as the primary reference for claims 68-71.

19. It would have been obvious to one of ordinary skill in the art to incorporate a discrete film in the manner taught by Avanzino in order to eliminate hillocks as taught by Avanzino (Col. 7, Lines 4-6).
20. With respect to the claimed thickness of claim 71, see paragraph 12.

### ***Response to Arguments***

21. Applicant's arguments filed November 30, 2007 have been fully considered but they are not persuasive. Applicant contends that examiner's remarks regarding the prior art's drawing and MPEP 2125 are moot, because allegedly the prior art is not enabled based on applicant's declaration. To support his position, applicant cited several cases dealing with prior art and enablement. However, these cases were not found to be analogous to the case at bar. After careful consideration of the declaration and cited case law, the previous rejection is maintained.
22. The cited cases dealt with two distinct instances based on chemical compounds. The first line of cases was based on a prima facie obvious doctrine that similar compounds behave the same. The courts found it acceptable as a means to rebut a prima facie case to show that there was no known way to make that claimed invention, and that the prior art disclosed only how to make a similar product, but not the claimed invention. The second line of cases dealt with instances where the prior art provided nothing in its written disclosure of how to make its own chemical compound. In order to protect the public from individuals just stringing together elements without any ability to make it, the courts concluded that for a reference to be prior art that it must be enabled.



23. Neither of these fact patterns are analogous to the case at bar, because the prior art as acknowledged by applicant discloses CVD as its means to make its structure that anticipates the claimed invention. Contrary to applicant's attempts, nothing cited by applicant allows a patent to effectively be invalidated or overcome, because applicant questions the methodology used. Because the prior art discloses how to make its invention, unlike when nothing is provided, enablement has been established.

24. Lastly, even assuming applicant was correct that a mere declaration could overcome a patent's presumption of validity. Applicant's declaration speaks generally only to a single step application of CVD that tends to form a tear drop shape. However, Yoshida uses both a deposition and etching step shown in Figure 2. Nothing in applicant's declaration or its supporting document addresses the feasibility of Yoshida's structure when those additional steps are used. Moreover, newly cited Avanzino'557 (U.S. 5,990,557) teaches a similar method during its intermediate filling, which corroborates that use of a CVD deposition/ etching process enables a gap to be formed between wirings with a uniform width (see Avanzino'557; Fig. 5). For the reasons stated, the rejection is maintained and made final.

### ***Conclusion***

25. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

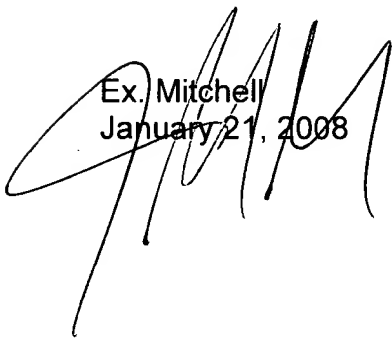
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*Carl Whitehead Jr.*  
*SE Au 2813*

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Ex. Mitchell  
January 21, 2008

A large, stylized handwritten signature in black ink, consisting of several loops and a long trailing line, is written over the typed text.